REMARKS

The Office Action dated December 14, 2005, has been carefully considered. Claims 2-10, 13, 20, 27, 28, 31, 33-35, 37-48, 62, 63, 66, 68-73, 75-78, 80-83 have been amended. Claims 1, 36, 74, 79, 98, and 99 have been canceled. Claims 102-115 have been added. Claims 2-35, 37-73, 75-78, 80-83, 102-115 are in this application. Applicants' representative thanks the Examiner for the courtesies extended during an April 26, 2006 interview.

The claims were rejected under 35 U.S.C. § 112 as indefinite in view of the alternative recitation of (or). The claims have been amended to eliminate the term "or" to obviate the Examiner's rejection.

New claims 102-106 correspond to previous claim 1. New claims 107-111 correspond to previous claim 36. New claim 113 corresponds to previous claim 79. Claim 114 corresponds to previous claim 98. Claim 115 corresponds to previous claim 99.

The previously presented claims were rejected under 35 U.S.C. § 103 as obvious in view of previously cited U.S. Patent No. 6,068,751 to Neukermans. Applicants submit that the teachings of this reference do not teach or suggest the invention defined by the present claims.

As discussed during the interview, Applicants submit that the present invention comprises of a method of fluidic control which relies on the combination of thermocapillary forces and substrate chemical patterning. The thermocapillary forces applied to the liquid necessitate the use of temperature gradients oriented essentially parallel to a fluid/liquid interface. This in turn requires that the interface be always in direct contact with a fluid phase, such as the ambient atmosphere. Chemical patterning is used to laterally confine the flow by causing the liquid to be either attracted to (i.e., wetting or hydrophilic) or repelled from (i.e., non-wetting or hydrophobic) designated regions. The chemical patterning can be applied to flat or topologically textured substrates which may include indentations, grooves or ridges whose surfaces must nonetheless remain open to a fluid phase such as the ambient atmosphere.

Neukermans discloses a microfluidic delivery system including a microfluidic valve for controlling a flow of fluid through an elongated capillary. The capillary is enclosed by a layer of malleable material. A blade is activated toward the malleable material to occlude the capillary

thereby barring liquid from flowing into the capillary. The blade is retracted away from the malleable material to allow fluid to flow into the capillary. Pressure applied to a fluid reservoir urges liquid in the reservoir to flow along the capillary when the blade is in the retracted position. A reaction chamber coupled to the capillaries can be heated as required for a chemical process. As discussed during the interview, Neukermans teaches heaters to initiate a chemical retention but does not teach or suggest that use of one or more heating elements for movement of liquid along one or more surface pathways in a predetermined flow path.

With regard to claims 23 and 56, Neukermans does not teach or suggest a method or device wherein said liquid is one or more droplets and activation of a first said thermal map traps said one or more droplets. With regard to claims 28 and 63 Neukermans does not teach or suggest a method or device use of surface pathways for mixing a first and second liquid.

With regard to claims 70 and 71, Neukermans does not teach or suggest a method or device for dividing a stream of liquid including individually activating one or more heating elements.

With regard to claims 72 and 73, Neukermans does not teach or suggest a method or device for mixing two or more liquids including individually activating one or more heating elements.

Accordingly, the invention defined by the present claims is not obvious in view of Neukermans.

The previously presented claims 98 and 99 were rejected as obvious in view of pages 353-355 of "Thermocapillary Pumping of Discrete Drop in Microfabricated Analysis Devices" by Sammarco et al.

Sammarco et al. teach fluidic control within the interior of a rectangular capillary by heating one end of a liquid droplet via heaters embedded within a glass substrate. In order for this flow mechanism to work at all, the liquid droplet must be confined to an interior channel. As soon as the droplet is no longer completely enclosed within a channel (for example by removing either the top, bottom or one side wall), then the flow mechanism fails to work altogether.

As described during the interview, Sammarco et al. do not teach or suggest flow of a liquid by thermocapillary shear stresses. To the contrary, Sammarco et al. describe application

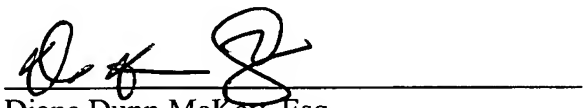
of a thermal gradient oriented perpendicularly and not in parallel to the gas-liquid interfaces comprising the front and back ends of a liquid plug.

Furthermore, Sammarco et al. do not teach or suggest receiving liquid on a surface having an open architecture and having chemical patterning. In addition, Sammarco et al. do not teach or suggest storing the device in glycerol as defined by present claims 114 and 115. There is no teaching or suggestion of a sample storage nor of the use of glycerol for preserving hydrophilicity. Rather, Sammarco et al. refer only to the use of glycerol as one of a number of liquid samples for testing the operation of their device. Accordingly, the invention defined by claims 114 and 115 is not obvious in view of Sammarco et al.

In view of the foregoing, Applicants submit that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should he believe that this would expedite prosecution of this application. It is believed that no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

Dated: May 15, 2006



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